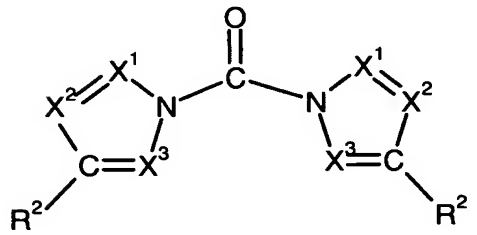
Claims

1. A process for preparing N,N'-carbonyldiazoles of the general formula (I)



(I),

where either

X^1, X^2 and X^3 independently of one another are each CR^1 or nitrogen, R^1 being hydrogen or straight-chain or branched C_1-C_6 alkyl, and

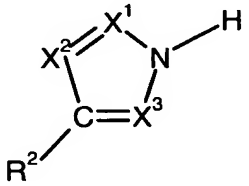
R^2 is hydrogen,

or

X^1 and X^3 are CR^1, the radical R^1 in X^1 being hydrogen or straight-chain or branched C_1-C_6 alkyl and the radical R^1 in X^3 forming, together with R^2, a -CH=CH-CH=CH- bridge, and

X^2 is CR^1 or nitrogen, R^1 being hydrogen or straight-chain or branched C_1-C_6 alkyl,

by reacting azoles of the general formula (II),



(II),

in which the radicals and symbols used have the definitions indicated for the general formula (I),

with phosgene in a polar solvent, which is characterized in that

(i) a polar solvent from the group consisting of ethers, ketones and chlorinated aliphatic solvents is used which possesses a maximum water content of 0.5% by weight, and

(ii) in that the azole of the general formula (II) and also the phosgene are metered into this solvent in such a way that in the time within which 1 mol of azole of the general formula (II) is metered in at the same time 0.17 to 0.34 mol of phosgene is metered in.

2. Process according to Claim 1, characterized in that either two different azoles or else only one single azole of the general formula (II) are or is used.

3. Process according to Claim 1 or 2, characterized in that one or two azoles of the general formula (II) is or are used in which independently of one another one or two of the moieties X^1, X^2 and X^3 is or are nitrogen.

4. Process according to one or more of Claims 1 to 3, characterized in that one or two azoles of the general formula (II) is or are used in which independently of one another X^1 is CH, X^2 is nitrogen and X^3 is CR^1, R^1 and R^2 together forming a -CH=CH-CH=CH- bridge.

5. Process according to one or more of Claims 1 to 4, characterized in that imidazole, benzimidazole, pyrazole or 1,2,4-triazole is used as the azole of the general formula (II).

6. Process according to one or more of Claims 1 to 5, characterized in that in total 0.2 to 0.3 mol, preferably 0.22 to 0.27 mol, in particular 0.24 to 0.26 mol of phosgene is used per mole of azole of the general formula (II).

7. Process according to one or more of Claims 1 to 6, characterized in that ethers used are linear or cyclic aliphatic ethers and diethers, especially MTBE, dimethyl ether, diethyl ether, dibutyl ether, THF, 2-methyl-THF, 2,5-dimethyl-THF, dioxane, ethylene glycol dimethyl ether or ethylene

glycol diethyl ether, aromatic ethers, especially anisole and chlorinated derivatives of anisole, and also mixtures of the aforementioned solvents.

8. Process according to one of more of Claims 1 to 7, characterized in that ketones used are linear or cyclic aliphatic ketones, especially acetone, 2-butanone, diethyl ketone, dipropyl ketone, cyclopentanone, cyclohexanone or cycloheptanone, and also mixtures of the aforementioned solvents.

9. Process according to one or more of Claims 1 to 8, characterized in that chlorinated aliphatic solvents used are methylene chloride, chloroform or 1,2-dichloroethane.

10. Process according to one or more of Claims 1 to 9, characterized in that the polar solvent possesses a water content of not more than 0.2%, preferably 0.1% and in particular 0.05% by weight.

11. Process according to one or more of Claims 1 to 10, characterized in that the azole of the general formula (II) and also the phosgene are metered in simultaneously to the polar solvent from the group consisting of ethers, ketones and chlorinated aliphatic solvents is such a way that in the time within which 1 mol of azole of the general formula (II) is metered in at the same time 0.2 to 0.3 mol, in particular 0.24 to 0.28 mol, of phosgene is metered in.

12. Process according to one or more of Claims 1 to 11, characterized in that the reaction vessel is charged with up to 10% by weight, preferably 0.1% to 2% by weight, of the total amount of the azole of the general formula (II), in the form of a solution or suspension, in the reaction vessel, and subsequently the further amount of the azole, and the phosgene, are metered in simultaneously as specified in Claims 1 and 10.

13. Process according to one or more of Claims 1 to 12, characterized in that the reaction mixture is worked up by separating off the azole hydrochloride precipitate at 20 to 100°C, preferably 40 to 80°C, by

filtration and isolating N,N'-carbonyldiazole from the filtrate by cooling the mother liquor to +40 to -70°C, preferably to +25 to -20°C, and filtering off the product that crystallizes out in the course of cooling.

14. Process according to one or more of Claims 1 to 13, characterized in that the reaction mixture is worked up by separating off the azole hydrochloride precipitate at 40 to 80°C by filtration as indicated in Claim 13 and concentrating the filtrate completely and thereby removing the solvent.